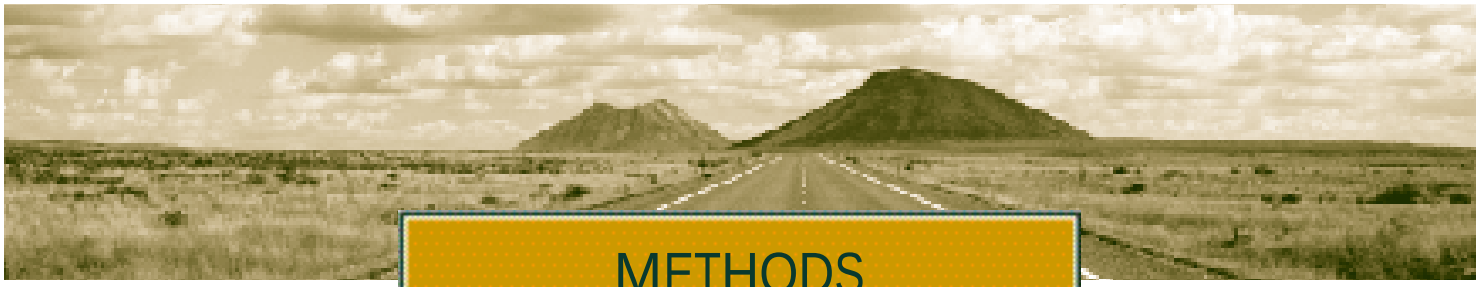

METHODS

Sampling Design

In 1997 and 1998, Montana used a Mitofsky-Waksberg three-stage cluster sampling technique for the BRFSS surveys. In this design, telephone numbers were randomly selected from blocks of 100 numbers, which were generated from the set of all existing prefixes in the state (Montana only has one area code). Sampling was then carried out in three stages. In the first stage, selected blocks of 100 randomly ordered numbers were screened to determine household status of the first phone number in each block. Blocks remained in the sample only if a residence was reached. In the second stage, the 100 numbers in the accepted block were dialed at random to identify additional households. In the third stage, individual respondents were randomly selected from all adults aged 18 and older living in a household. The selected adult was then interviewed in accordance with the BRFSS protocol (CDC 1998). In 1997 and 1998, a minimum of 150 interviews were completed per month for yearly totals of 1,803 and 1,804 interviews, respectively.

Montana interviews were conducted by Northwest Resource Consultants (Helena, MT) at facilities located at the Montana Department of Public Health and Human Services (DPHHS). Interviews were conducted during daytime and evening hours on Monday through Friday, and during daytime hours on weekends to ensure that selected individuals had ample opportunity to participate in the survey. Fifteen efforts were made to reach a phone number at different times of the day and evening and on different days before being classified as an unreachable number. The Council of American Survey Research Organizations (CASRO) response rate estimates for 1997 and 1998 were 72.6% and 72.1%, respectively. Five percent of completed interviews were verified by recontacting the respondent. Respondents selected for verification were contacted by an interviewer who did not conduct the original interview.

Data Weighting and Analysis

Data were weighted to account for differences in the probability of selection (e.g., households with more than one telephone number were more likely to be called). Post-stratification weighting based upon the population estimates for the respective survey year was used to ensure that the results more closely reflected the adult population of Montana.

A comparison of the demographic characteristics of the 1997 and 1998 survey sample with 1998 Census Bureau population estimates indicates that several population subgroups were either under- or over-represented in the samples (Table 2). Males and the 18- to 29-year age class may have been under represented, while females and the 65 and older age class may have been over-represented. Other subgroupings appear to have been sampled approximately according to their estimated occurrence in the population. The post-stratification weighting tends to correct for the apparent sampling error.

Respondents who indicated "don't know," "not sure," or "refused" were excluded from the calculation of prevalence estimates. SPSS® statistical package (SPSS, Inc. 1999) and the WesVar® Complex Samples™ module (Westat 1998) were used to compute prevalence estimates (expressed as percentages) and associated 95% confidence intervals using sample weights provided by CDC. Prevalence estimates based on denominators with fewer than 50 respondents were not reported due to the inherent low reliability. Analysis of subpopulations results in a concomitant lowering of sample size. The more subgroups into which the data are partitioned, the smaller the sample size per subgroup. To minimize this problem, when data were available for both 1997 and 1998, the data were combined for the analysis of subpopulations.

Data Reliability and 95% Confidence Intervals

As noted earlier, the BRFSS data represent a sample of the Montana adult population. It is not feasible to query the entire Montana population, so the sample is used to estimate population prevalences for health-risk behaviors.

The reliability of a sample statistic (e.g., prevalence) can be estimated by setting a confidence interval (sometimes referred to as the margin of error) around the statistic. By convention, 95% confidence intervals are generally used. As an example, a prevalence estimate for cigarette smoking is 21% with a computed 95% confidence interval of 2%, which translates to a lower limit of 19% and an upper limit of 23%. There is a 95% probability that the interval 19% to 23% includes the true percentage of smokers in the Montana population.

The width of a confidence interval (e.g., ± 2%) is dependent upon sample size. Estimates based on large samples have narrower confidence intervals and are more reliable than estimates based on small samples. Confidence intervals must be considered when making comparisons among subgroups of the population (e.g., among age classes). Percentages for different subgroups of the population can be determined to be significantly different if their confidence intervals do not overlap. A statistical test is needed to determine if estimates are likely to be different when the confidence intervals overlap.

Table 2. Distribution of the Montana 1997 and 1998 BRFSS survey sample and 1998 U.S. Census Bureau population estimates for the Montana adult population.

		BRFSS SAMPLE					
Demographic Group		1997	Percent* UW (W)	1998	Percent* UW (W)	1998 Census Bureau Estimate	Percent of Total Population
All Adults		1,803		1,804		656,050	
Sex	Males	760	42.1 (48.7)	787	43.6 (48.7)	322,106	49.1
	Females	1,043	57.8 (51.3)	1,017	56.4 (51.3)	333,944	50.9
Age	18-29	297	16.5 (20.2)	313	17.3 (20.1)	135,874	20.7
	30-34	578	32.1 (31.0)	548	30.4 (30.5)	189,941	29.0
	45-64	537	29.8 (29.3)	552	30.6 (30.0)	213,198	32.5
	65+	389	21.6 (19.4)	388	21.5 (19.4)	117,037	17.8
	Unknown	2		3			
Race	White, non-Hispanic	1,677	93.0 (92.7)	1,681	93.2 (92.9)	609,637	92.9
	Non-white or Hispanic	119	6.6 (6.9)	119	6.6 (6.9)	46,413	7.1
	Unknown	7		11			

* Unweighted (UW) and weighted (W) percentages.

Questionnaire

The questionnaire has three parts:

1) the core, consisting of the fixed core questions (asked every year), rotating core questions (asked in alternating years), and emerging core questions (asked for only one year);
2) optional modules provided by CDC, any number of which can be selected by individual states for inclusion; and
3) state-added questions (additional questions of specific interest to individual states).

All states must ask the core questions without modification in wording. As part of the core, respondents are asked to provide demographic information including sex, age, race, marital status, household income, employment status, and education level, in addition to questions on health-related behaviors. Optional modules and state-added questions are added by individual states to their respective questionnaires.

The Montana BRFSS Questionnaire consisted of 146 questions in 1997 and 159 in 1998. Not all respondents received all questions, since some questions pertain to specific age groups or sex, or persons with a particular condition (e.g., diabetes). The average length of time to administer the survey was 18 minutes in 1998.

Survey Limitations

Surveys that require self-reporting of data have limitations and should be interpreted with caution. Respondents may have the tendency to under-report behaviors that are socially undesirable, unhealthy, or illegal (e.g., drinking and driving or seat belt non-use) while over-reporting desirable behaviors (e.g., amount of exercise or regular health screening). The accuracy of self-reported information also is affected by the ability of respondents to fully recall past behaviors or health screening results.

Telephone surveys exclude households without telephones, which may result in a biased survey population due to under-representation of certain segments of the population. An estimated 96% of Montana households have at least one residential telephone. The four percent of homes without telephones may represent a population segment at high risk for preventable diseases associated with low socioeconomic status. The sampling procedures make no special effort to reach populations among which telephone lines per capita is lower than the norm.

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